Page 6, lines 4-9, replace the paragraph with the follow following rewritten paragraph:

--The synthesis of C_{36} is very sensitive to operational parameters, notably helium pressure. A series of experimental runs was carried out at different fixed static helium pressures between 50 and 1500 torr. Runs in the series at pressures significantly different from 400 torr failed to produce prominent peaks below 720 amu in the mass spectrum. To produce bulk amounts of C_{36} suitable for purification, arcing runs in 400 torr helium were repeated and the resulting soot was collected from the chamber walls.--

Page 8, lines 13-19, replace the paragraph with the follow following rewritten paragraph:

--An extractor 50 to extract fullerenes from graphite arc soot under inert conditions is shown in Fig. 4. Extractor 50 has a main tube 52 and a side tube 54 connected between the top and bottom of the main tube 52. The major modification in the extractor 50 is the inclusion of high vacuum Teflon stopcocks 56, 58 at the bottom and in the side tube. Water jacket 60 also surrounds main tube 52, reducing its length. A coarse frit 62 is placed across the main tube 52. The top of the extractor 50 is a female fitting 64 and the bottom is a male fitting 66.--

Page 8, line 21 to page 9, line 4, replace the paragraph with the follow following rewritten paragraph:

--The purified solid C_{36} material obtained was characterized using C-13 NMR, bulk electron diffraction, mid-infrared transmission, and solid state transport studies. For a 36 atom carbon cage with hexagonal and pentagonal faces, 15 different isomeric

structures are theoretically possible. Calculations indicate that the lowest energy isomers are structures with D_{6h} and D_{2d} symmetry. These two molecules can be distinguished by NMR spectroscopy. Mass spectrometry using a laser desorption/time of flight mass spectrometer shows that the material is C_{36}, as shown in Fig. 3.--

Page 10, lines 10-21, replace the paragraph with the follow following rewritten paragraph:

–The hexagonal and rhombohedral crystal symmetries are shown in Figs. 7A-D. Each is formed by stacking hexagonally symmetric planes of well separated C_{36} units. Figs. 7A-D show two kinds of stacking sequences, AB and ABC, corresponding to the hexagonal and rhombohedral crystals respectively. Figs. 7A, B respectively show a top view of the repeating planes and a side view showing the relaxed interlayer bonding for the AB stacking sequence. Figs. 7C, D respectively show a top view of the repeating planes and a side view showing the relaxed interlayer bonding for the ABC stacking sequence. The fundamental stacking unit is a plane of unbonded C_{36} molecules referred to as sheet 1 (S1) and the two crystals are labelled S1-AB and S1-BC for the two kinds of stacking. The C_{36} units are essentially noninteracting within an S1 sheet. (The AA stacking sequence (S1-AA) is not considered because it does not form a metastable structure.)–

Page 11, lines 6-10, replace the paragraph with the follow following rewritten paragraph:

–For S2-AA there is bonding between all six carbon atoms of the hexagon rings on top and bottom, as in the case of S1-AB. Stacking S2 sheets in the AB sequence

results in a slightly larger density and a substantially larger binding energy than S2-AA. It is the lowest energy crystal structure. The S2-ABC contains no interlayer bonding and is not likely to be stable.--

Page 12, lines 13-20, replace the paragraph with the follow following rewritten paragraph:

--The invention also includes endohedrally doped fullerenes and intercalated solids. An atom M may be placed in the center of a C_{36} molecule (M @ C_{36}). Binding energy calculations show that endohedral doping of C_{36} with alkali earth atoms Mg, Ca, and Sr, and also with Si, Ge, and Zr, is possible. The C_{36} fullerene appears to be the smallest size carbon cage which can easily trap additional atoms. As far as intercalation into the solid material, the S2-AB crystal structure has two cavities per C_{36} which can be doped with other atoms, e.g. Na or K. However, because of the ionic radiuses, Na appears to fit well but K causes structural changes.--

IN THE CLAIMS:

Replace amended Claim 1 with the following twice amended Claim 1:

1. (Twice Amended) A composition of matter comprising a solid state material consisting essentially of C_{36} fullerene molecules.

Delete Claims 11-18.

REMARKS